

CLAIMS:-

1. A communications multi-service network comprising a plurality of nodes
5 interconnected via quality of service capable tunnels and incorporating a frame-
mode MPLS architecture whereby IP services are run directly over a frame-based
core network and legacy services are run over ATM adaptations and emulated
ATM services.
- 10 2. A communications network comprising a plurality of core nodes establishing a
transport network, service nodes each coupled to a said core node to provide
access to the transport network, and a network management system arranged to
define and manage one or more virtual public/private networks within said
communications network, wherein groups of said core nodes are configured as
15 abstract nodes within which abstract nodes any available path may be selected to
achieve a requested connection, and wherein end to end label switched paths
are established via the management system by specifying a series of abstract
nodes.
- 20 3. A communications network as claimed in claim 2, wherein each said path is
specified by identifying first and second real nodes and one or more abstract
nodes therebetween.
4. A communications network as claimed in claim 3, wherein a said virtual
25 public/private network (VPN) is defined with multiple stages of first level
constraint-based routed label switched paths.
5. A communications network as claimed in claim 4, wherein each said abstract
node is defined by an IP address prefix, and all core nodes which include that
30 prefix in their IP address are part of that abstract node.
6. A communications network as claimed in claim 5, and incorporating a super-
ordinate management function arranged to control creation, modification and
deletion of virtual switches.

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7. A communications network as claimed in claim 6, wherein said super-ordinate manager is adapted for defining virtual private/public networks (VPN) and for placing traffic trunks to realise those VPNs
- 5 8. A communications network as claimed in claim 7, and incorporating a subordinate management function arranged to provide virtual switch management.
9. A communications network as claimed in claim 8, wherein a (sub) network manager is responsible for constructing an abstract node information model
10 representation of the network which it passes to a super-ordinate manager.
10. A method of operating a communications multi-service network comprising a plurality of nodes interconnected via quality of service capable tunnels, wherein ATM is used for low or medium capacity access, and wherein frame mode is
15 ~~used frame mode is~~ used for access to corporate users and for core transport.
11. A method of operating a communications multi-service network comprising a plurality of core nodes establishing a transport network, and service nodes each coupled to a said core node whereby access to the transport is provided, and
20 having a network management system arranged to define and manage one or more virtual public/private networks within said communications network, the method comprising configuring groups of said core nodes as abstract nodes within which any available path may selected to achieve a requested connection, and wherein end to end label switched paths are established via the
25 management system by specifying a series of abstract nodes.
12. A method as claimed in claim 11, wherein each said path is specified by identifying first and second real nodes and one or more abstract nodes therebetween.
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13. A method as claimed in claim 12, wherein a said virtual public/private network (VPN) is defined with multiple stages of first level constraint-based routed label switched paths.
- 35 14. A method as claimed in claim 13, wherein each said abstract node is defined by an IP address prefix, and all core nodes which include that prefix in their IP address are part of that abstract node.

15. A method as claimed in claim 14, and including creation, modification and deletion of virtual switches via a super-ordinate management function.
- 5 16. A method as claimed in claim 15, wherein said super-ordinate manager is adapted for defining virtual private/public networks (VPN) and for placing traffic trunks to realise those VPNs.
- 10 17. A method as claimed in claim 16, wherein ATM is used for low or medium capacity access, and wherein frame-mode is used for access to corporate sites and for core transport.

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